Space Weather Forecast

Issued on Monday, 30 January 2023 at 00:57 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Slight chance of R1/R2 Radio Blackouts. Slight chance of Minor Geomagnetic Storm Days 2-3 (31 Jan-01 Feb).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Low with isolated Common-class flares, the largest of these peaking at 29/0012 UTC, associated with a filament eruption (arc of plasma) near the northeast limb.. There are currently six sunspot regions on the visible disc, all of which appear small, weak and magnetically simple. One of these is a new region emerging around the southeast limb, but currently appears small and simple.

A large filament (arc of plasma) was seen lifting off the southwest quadrant at 29/2100 UTC, although no Coronal Mass Ejection (CME) has been observed at present. No Earth-directed Coronal Mass Ejections (CMEs) were seen in available imagery.

Solar Wind / Geomagnetic Activity: The solar wind shows that Earth is in a coronal hole fast wind. Wind speed was mostly elevated to slightly elevated, varying between 520-470 km/s. The total Interplanetary Magnetic Field was weak, with the north-south component also varying weakly. Geomagnetic Activity was Quiet (Kp 0-2).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) persisted at background levels with no solar radiation storms.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is expected to be predominantly Low, with a slight chance of isolated Moderate-class flares.

Solar Wind / Geomagnetic Activity: No Earth-directed CMEs are expected during this period. Earth is currently experiencing a coronal hole fast wind which is just starting to wane. Wind speeds are expected to slowly decline through the next couple of days, likely to slow levels. A further pair of coronal holes are likely to bring an increase in wind speeds later in the period. The timing of this is somewhat uncertain at present, but the most likely arrival time is considered to be sometime during Day 3 (01 Feb), with low confidence.

Geomagnetic activity is expected to be Quiet to Unsettled (Kp 0-3) for much of the period. Either on Day 2 or 3 (31 Jan-01 Feb), activity is likely to increase slightly with a chance of Active (Kp 4) intervals, and a slight chance of isolated G1/Minor Storm (Kp 5) intervals when the fast wind arrives. The effects of the fast wind may persist into Day 4 (02 Feb), before starting to wane.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is currently expected to remain at background levels with no solar radiation storms.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	10	20	20
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	10	10	10	10
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	1	1	1	1
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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